

REMARKS

The above Amendments and these Remarks are in reply to the Office Action mailed July 25, 2005.

Currently, claims 1-84 are pending. Applicants have amended claims 1, 4-6, 9-11, 14, 16-19, 25-26, 29-31, 34-36, 41-42, 48, 50, 65, 71, and 80. Applicants respectfully request reconsideration of claims 1-38, 41-48, 50-84.

I. Summary of the Examiner's Objections

Claims 1-5, 7-11, 15, 16, 19-22, 26-30, 32-36, 39, 40, 42-45, 50-54, 65-69, 71-74, and 80-83 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kakimoto et al.* (U.S. 5,522,683) in view of *Steffan et al.* (U.S. 6,084,679)

Claims 12, 13, 17, 23, 24, 37, 38, 41, 55-61, and 75-78, were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kakimoto et al.* in view of *Steffan et al.*, as applied to Claims 1, 26, 50, and 75 above, and in further view of *Dils et al.* (U.S. 2004/0265079).

Claims 6, 14, 25, 31, 48, 49, 62-64, 70, 79, and 84 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kakimoto et al.* in view of *Steffan et al.*, as applied to Claims 1, 26, 50, 71, and 80 above, and in further view of *Olds* (U.S. 5,741,096).

Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Kakimoto et al.* in view of *Steffan et al.* and *Dils et al.*, as applied to Claim 17 above, and in further view of *Olds*.

II. Remarks

Rejections Based on Obviousness

The claims have been amended to define a tool or a tool system operating with respect to or following "a laser guide line". The Examiner had previously rejected claim 6 defining a "first guide"

as a “laser beam” as obvious over *Kakimoto et al.* in view of *Steffan et al.* et al by further incorporating *Olds* to reject claim 6.

It is respectfully submitted that *Olds* in combination with *Kakimoto et al.* and *Steffan et al.* does not render a tool following “a laser guide line” obvious.

Claim 1 provides:

a first guide system providing a first laser guide line; and
a tool including:
an action component adapted to operate on said work piece by following the laser guide line on the work piece,

The references, even if combined in the manner suggested by the Examiner, do not render the claimed invention obvious. *Kakimoto et al.* is directed to an automated drilling system for printed circuit boards. *Kakimoto et al.* distinguished itself by having illumination on the top and bottom so that marks on either side can be detected. *Kakimoto et al.* teaches finding a point and moving a tool toward that point. It does not teach moving a workpiece to a line. Hence, *Kakimoto et al.* fails to teach the claimed action component, guide detector and location detector working relative to a “guide line”.

Steffan et al. is directed to using universal alignment marks on a semiconductor wafer. The marks do not disclose “following the guide line” on a work piece. As noted in *Steffan et al.*:

a universal alignment mark that would be used by a scan tool or an analysis tool to establish an accurate coordinate system. Upon adoption of a mark such as the one shown in FIG. 4, each tool vendor would incorporate an algorithm that would use the alignment marks to accurately position the optical or other observing element in the analysis tool. (Col. 5, lines 25-31)

As such, any tool using the line would not “follow” the alignment mark, but would use the marks for a reference point. Further, such marks do not constitute a “laser” guide line.

Olds teaches a “laser line assisted alignment apparatus”, but on inspection of the specification, *Olds* does not teach a “laser guide line” working on concert with other elements of an apparatus as defined in the present claims. In *Olds*, it is clear that laser line generators provide “fan” beams which are

used to project an alignment marker onto a workpiece, however, the “fan” beams provide a reference point, not a “guide line”. In operation, the drill device does not have “an action component ... following the laser guide line” nor the “guide detector” or location detector operating with respect to the laser guide line. Rather, two line generators are used to define a reference point on a workpiece for use by a camera positioning system or an operator:

... laser line generators 46a and 46b are preferably placed on the perimeter of the semicircular platform 44 at positions 90 degree apart with respect to axis 37, and their respective fan beams 48a and 48b point upward at 45 degree angles with respect to the reference plane 30, as shown in FIG. 2. ... the fan beams 48a and 48b form 10 degree fan angles presenting two vertical planes. ... (Col. 4, lines 6-13)

... The camera 56 is connected to a monitor 58, as shown in FIG. 2, allowing the operator to shift the position of the component 28 using an image in the monitor 58 to show when ***the marked point 52 is aligned with the intersection of cross-hairs 49 which are the visible manifestations of the fan beams 46a and 46b on surface 40***, as shown in FIG. 4. ... (Col. 4, lines 26-31) (Emphasis added.)

In an alternative embodiment, the need for an operator can be eliminated by connecting the output from the camera 56 to a frame grabber (not shown) which determines the position of the marked point 52 relative to the intersection of the cross-hairs 49. (Col. 4, 38-43)

Hence, two line generators provide “fan beams” which are used to project a cross hair on the workpiece to align a drill bit with a marked point. While an alignment process is used to calibrate the intersecting fan beams with the drill axis, the tool does not follow the beams in operation:

Once the component 28 is contiguous with the pressure feet 32, the operator observes the image in the monitor 58 and visually searches for a visible set of the cross-hairs 49 caused by the projection of the intersecting fan beams 48a and 48b on the lower surface 40 of the component 28. The set of the cross-hairs 49, as shown in FIG. 4, is typically about three inches square, and is used by the operator to line up the marked point 52 on the lower surface 40 of the component 28 with the axis 37 of the drill bit 38. This is accomplished by overlapping the intersection of the set of cross-hairs 49 with the marked point 52. Once the marked point 52 and the set of cross-hairs 49 have been aligned, the cylinder 36 is actuated, preferably by depressing a foot pedal, causing the anvil 34 to rise toward the pressure feet 32 until the component 28 is clamped into place against the pressure feet 32. (Col. 6, lines 42-57)

Hence, *Olds* fails to teach a tool which follows a laser guide line, or utilized other components as claimed which operate with respect to the laser guideline. Thus, even were the

referenced combined as suggested by the Examiner, the combined teachings of the references do not render the claimed invention obvious.

The Examiner states that “*Olds* teaches in Figures 2 and 4 a line-laser assisted alignment apparatus comprising a mark (52) on a workpiece (28) that is created by laser guides (48a and 48b)” and that it therefore “would have been obvious ... to use a laser guide system in *Kakimoto et al.* ... to provide an alignment means where the work piece may not be capable of having a mark on its surface” (Office Action Page 11).

However, *Olds* does not teach a tool following a laser guide line. The claim makes clear that the laser guide line is used by various components of the invention to “...to detect a position of said first laser guide line and provide first guide position data corresponding to said position of said first guide” and “...to determine an orientation of said action component relative to said laser guide line,” as defined in claim 1.

Neither *Kakimoto et al.*, *Steffan et al.* nor *Olds* teaches or suggests such limitations. As such, claim 1 and claims 2-25 dependent therefrom, are not obvious.

Independent claim 26 includes limitations similar to those set forth above making clear the operation of the tool is not obvious in view of the prior art:

- an action component adapted to operate piece on said work piece relative to a laser guide line,

- a guide detector adapted to detect a position of at least a first laser guide line and provide first guide position data corresponding to said position of said first laser guide line; and

- a location detector in communication with said guide detector to receive said first laser guide position data, wherein said location detector is adapted to determine an orientation of said action component relative to said first laser guide line, based at least in part on said first laser guide position data.

The combined references would not render the claimed action component, guide detector and location detector, operating with respect to a “laser guide line” as defined in the claims. For the

reasons set forth above with respect to claim 1, it is respectfully submitted claim 26 and claims 27-38, 41-48 dependent from claim 26 and including all the limitations thereof, is not obvious.

Further, independent claim 50 includes limitations similar to those set forth above including:

- an action component adapted to operate on said work piece along a laser line,
- a location detector adapted to determine an orientation of said component relative to the laser line, based at least in part on a position of a set of one or more laser guide lines, and provide orientation information corresponding to said orientation; and

- a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

Likewise, independent claim 71 includes similar limitations:

A tool adapted to operate on a work piece, said tool comprising:

- an action component adapted to operate on said work piece along a laser guide line;

- ... the steps of:

- (a) determining an orientation of said tool based at least in part on a position of a set of one or more laser guide lines;

The combined references would not render the claimed action component, guide detector and location detector, operating with respect to a "laser guide line" as defined in the claims. For the reasons set forth above with respect to claim 1, it is respectfully submitted claim 50 and claims 51-64 dependent from claim 50, and claim 71 along with claims 72-79 dependent from claim 71 and including all the limitations thereof, is not obvious.

Based on the above amendments and these remarks, reconsideration of claims 1-38, 41-48, 50-84 is respectfully requested.

The Examiner's prompt attention to this matter is greatly appreciated. Should further questions remain, the Examiner is invited to contact the undersigned attorney by telephone.

A Request for Continued Examination is submitted herewith. Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for extending the time to respond up to and including today, January 25, 2006.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Date: January 25, 2006

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